Health Science Education Standards
Algebra

Health Science Standard:

Standard 1.0

The student will know and apply the academic subject matter required for entrance within Health Science.

Academic Standard:

3.8 The student will apply the concept of rate of change.
3.9 The student will analyze graphs to describe the behavior of functions.
3.12 The student will interpret graphs that depict real-world phenomena.

Line graphic each group

Resting pulse rate
Pulse p activity
5 minute & 10 minute post activity pulse rate

Competency:

Problem: Divide students into 3 groups. Get with partner and check and record pulse for ÷ minutes. Team 3 then starts their 1st of 3 laps around a track. p Team 3 as they finish 1st lap. Team 2 joins Team 3 on the track and then Team 1 joins Teams 3 and 2. p of 2nd group as they finish 1st lap. All groups end @ the same time. After all groups finish, check post activity pulse rate and record. Check pulse 5 minute and 10 minute p activity. Then take each team's average at resting, post activity, 5 minute p activity and 10 minute p activity. Have all students to complete line graph with various pulse rates. Record starting time of activity and ending time of activity.

Skill:

Evaluation: Graph all information and compare and contrast the results of each group (comparing to normal range). Research the effect of physical activity on the heart using Nursing Assisting guidelines to demonstrate ability to perform vital signs.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 2.0

Students will explain the various methods of giving and obtaining information. They will demonstrate usage of all forms of communication and evaluate roles and responsibilities.

Academic Standard:

3.2 **The student will analyze mathematical patterns related to algebra and geometry in real-world problem solving.**

3.5 **The student will solve problems in number theory, geometry, probability and statistics, and measurement and estimation using algebraic thinking and symbolism.**

3.10 **The student will interpret results of algebraic procedures.**

911 Emergency calls

Competency:

Problem: Student will obtain information from central dispatch on time spent on emergency calls and non-emergency calls; dispatching information to ER (hospital), Fire Department, and Police; and what the cost is for 911 service to operate for 1 month (payroll, utilities, building, equipment, misc.).

Skill:

Evaluation: Student will organize the data from (911) central dispatch to find the cost of emergency versus non-emergency cost. Assess how the cost may change if non-emergency calls were eliminated by effective education to the community.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 3.0

The student will understand how the health care workers' role fits into their department, organization, and overall health care environment. They will demonstrate how key systems affect services they perform and quality of care given.

Academic Standard:

3.12 The student will interpret graphs that depict real-world phenomena.

Competency:

Problem: The student will gather information from doctor's office/clinic on total number of patients seen during one month. The illness or condition will be grouped into categories and displayed on a circle graph by: respiratory disorder, routine exams, broken bones, cardiovascular disorders, and others. How many of the patients return to clinic for no improvement of illness?

Skill:

Evaluation: From the information gathered, the students will find the percentage of patients that were seen in each category. They will display this information in a circle graph. Discuss the importance of quality of health care.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 4.0

The student will analyze how employability skills enhance employment opportunities and job satisfaction. They will demonstrate key employability skills and procedures/training to maintain skills as needed for the job market.

Academic Standard:

3.3 The student will use algebraic thinking to generalize a pattern by expressing the pattern in functional notation.

3.1 The student will recognize, extend, and create geometric, spatial, and numerical patterns.

Competency:

Problem: Each student will investigate career option in the health care field. Student will find out how much education is required, cost of education, availability of job in their area, and salary per year.

Skill:

Evaluation: The student will present the health career option using National HOSA Career Health Display guidelines on Health Career at the local job fair.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 5.0

The student will evaluate legal responsibilities, limitations, and implications of actions within the health care delivery system. They will perform duties according to regulations, policies, laws, and rights of clients.

Academic Standard:

3.6 **The student will communicate the meaning of variables in algebraic expressions, equations, and inequalities.**

3.11 **The student will apply the concept of variable in simplifying algebraic expressions, solving equations, and solving inequalities.**

3.14 **The student will articulate and apply algebraic properties in symbolic manipulation.**

Competency:

Problem: Dr. Smith ordered 250mg Ampicillin 1m g AM. When the nurse (from the nursing home) comes in, she gives Mrs. Day 1Gm Ampicillin 1m g AM. One hour later Mrs. Day is in the hosp. c amaphilatic shock reaction. Mr. Day decides to bring legal actions against the nursing home.

Skill:

Evaluation: The student will identify errors in the way the medicine was given. Debate who was at fault, the doctor's writing or the nurse's calculations of the order. Discuss the cost of malpractice insurance on doctor and nurse.

The problem is $\frac{250mg}{x} - \frac{1Gm}{1000mg}$

$\frac{250}{1000}$

= .25Gm

Health Science Education Standards
Algebra

Health Science Standard:

Standard 6.0

The student will evaluate accepted ethical practices with respect to cultural, social, and ethnic differences within the health care environment.

Academic Standard:

"expense versus return of the investment"

3.16 The student will graph inequalities and interpret graphs of inequalities.

Competency:

Problem: Research the number of pt. that use English as a second language. Find out procedure for admitting a pt. that cannot speak English. Do cost evaluation for staffing translators on a full time basis in the ER. Determine if translator is needed for 24 hours or just during the peak periods.

8% of population

Skill:

Evaluation: Written report on their evaluation of the demand for a translator versus the cost of the translator.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 7.0

The student will analyze the existing and potential hazards to clients, co-workers, and self. They will prevent injury or illness through safe work practices and follow health and safety policies and procedures.

Academic Standard:

3.17 The student will describe the domain and range of functions and articulate restrictions imposed either by the operations or by the real-life situations which the functions represent.

(7 factories) Students divide into groups of 2-3.

Competency:

Problem: Student investigates the number of back injuries at a local factory during a 6-week period. Student will teach proper body mechanics to employees of the 7:00-3:00 shift but will not give instruction on proper body mechanics to the 3:00-11:00 shift employees. After training of body mechanics, assess any current back injuries.

Skill:

Evaluation: Make a graph showing back injuries before and after the body mechanics training is completed. A study is made to determine the effect of proper body mechanic training on the number of back injuries.
3:00-11:00 shift – control group
7:00-3:00 shift – experimental group
The number of injuries is recorded before and after body mechanic training in each group.
Draw conclusion concerning the experimental versus the control group.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 8.0

The student will apply the responsibilities necessary to become a member of the HOSA team.

Academic Standard:

3.15 The student will identify relationships which can and which cannot be represented by a function.

This project is designed to increase membership of HOSA.

Competency:

Problem: HOSA officers market HOSA program at school by making a video to show high school or Channel 1 and in the local community. The video will include background information on HOSA, activities of the club and community involvement. The students will be responsible for getting all equipment needed, as well as, for organizing and editing the video.

Skill:

Evaluation: Each student is awarded points for participation and is graded by peers.

Students will be graded on input of ideas, participation, knowledge of material, and encouragement of groups.

Health Science Education Standards
Algebra

Health Science Standard:

Standard 9.0

The student will perform skills necessary for physical assessment of health status.

Academic Standard:

3.4 **The student will solve linear systems using a variety of techniques, including matrices.**

3.7 **The student will identify and represent a variety of functions.**

Competency:

Problem: Each student will record a diet journal for 1 week. Writing down the amount of food, calculate total calorie intake and analysis the protein, fats, and carbohydrates in grams. Their food intake will be compared with their ht., wt. & activity level. This analysis will encourage proper nutrition for life-long health. Repeat process for 3rd grade students. Assign each high school student to 3rd grader to obtain ht., wt., and dietary intake for one day.

Skill:

Evaluation: Calorie calculation & protein, fat, carbohydrate intake will be compared to FDA standards. The students will evaluate and recommend any adjustments necessary for health nutrition. Do bar graph showing 3rd graders and high school students overweight, underweight, and average.

Standard 1.0

Problem: Divide students into 3 groups. Get with partner and check and record pulse for ÷ minutes. Team 3 then starts their 1st of 3 laps around a track. p Team 3 as they finish 1st lap. Team 2 joins Team 3 on the track and then Team 1 joins Teams 3 and 2. $\bar{p}$ of 2nd group as they finish 1st lap. All groups end @ the same time. After all groups finish, check post activity pulse rate and record. Check pulse 5 minute and 10 minute $\bar{p}$ activity. Then take each team's average at resting, post activity, 5 minute p activity and 10 minute $\bar{p}$ activity. Have all students to complete line graph with various pulse rates. Record starting time of activity and ending time of activity.

Resting Pulse rate and change due to Activity

Standard 2.0

in one week total calls were 120
37 emerg. 83 non-emerg.

$$\frac{83}{120} = 69\%$$ **non-emerg. calls**

Oper. expenses for one month

Payroll (dispatchers) 24 hr/day @ 7 day/wk @ $5.25/hour

$882
$160(+ payroll exp.) $160
$1042/wk x 4 = $4168

this is for only 1 dispatcher at a time on payroll.
peak period is 4 – 12 p.m. Wed – Sat. So currently 2 dispatchers are needed during these hours.
8 x 4 x $5.25 = $168 (30 pe) = $198/wk
x4
$792/mo.

total dispatcher payroll
$4168
+ 792
$4960

emergency calls	non-emergency calls
31% x $4960	69% x $4960
$1537.60	$3422.40

preventing non-emergency calls would not save $3422.
but you could probably eliminate the 2nd dispatcher on Wed. – Sat. saving $792 / mo.

Standard 3.0

		%
respiratory	376	57
cardiovascular	181	27
broken bones	3	1
routine exams	42	6
other	57	9
total / wk	659	100%

Standard 4.0

RN – occupational goal

education:	4 yrs
cost:	$40,000
annual salary	$30,000

Compare to cost of living.

Are you willing to spend this time and effort to be a RN?

Standard 5.0

250 mg = 0.25 g

1 g was too much medication

error in calculation!

oops!

$$\frac{250\ mg}{1} \times \frac{1g}{1000\ mg} = \frac{250}{1000}$$

=0.25g

Standard 6.0

8% use English as 2nd language
0.08 x 20,000 population
1600 people

possibly have a translator on call instead of in house 24 hrs / day
the cost would be less!
business does not warrant full time translator.

Standard 7.0

Control		**Experimental**	
3-11 shift		**7-3 shift**	
18 injuries	**26%**	**31 injuries**	**26%**
70 employees		**120 employees**	

after training in body mechanics

15 injuries	**21%**	**11 injuries**	**9%**
70 employees		**120 employees**	

this was a significant drop!

Standard 8.0

	Input of ideas	Participation	Knowledge of Material	Encouragement to Group
Lisa	**5**	**5**	**5**	**5**
Anna	**2**	**4**	**5**	**3**
Jason	**2**	**3**	**4**	**2**
Rosie	**3**	**4**	**5**	**3**
Thelma	**4**	**4**	**4**	**4**
Louise	**5**	**2**	**4**	**3**
Mary	**3**	**5**	**5**	**4**
Thomas	**4**	**5**	**5**	**5**

	Student Total	Grade
Lisa	**20**	**100**
Anna	**14**	**70**
Jason	**11**	**55**
Rosie	**15**	**75**
Thelma	**16**	**80**
Louise	**14**	**70**
Mary	**17**	**85**
Thomas	**19**	**95**

Standard 9.0

	cal	9cal/Gm fat	4cal/Gm carbo	4cal/Gm
blueberry muffin	**%**	**%**	**%**	**%**
chocolate 5				
chicken strip 3				
2 slices tomato				
potato salad ½ cup				
salad				
onion rings				
baked potato/butter				
Total				

Compare to FDA standards &
Recommendation to improve diet

_____

Ht _____
Wt _____
Activity level_____ **low** **moderate** **active**

	3rd graders	H.S. students
under	5	4
avg.	16	9
over	2	7
total	23	20